

# Pathways to a Green Energy Transformation

Kiev

15 Novemebr 2018

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ЭКОДОМ

## Belarus Energy Sector: Main Figures

**GDP-2017**

**54.44**

**Total Energy Consumption, MTCE**

**35.6**

**Domestic Primary Energy Supply-2016, MTCE**

**5.3**

### Indicator of Current Energy Plan

**2016**

**2035**

**Domestic Energy Supply to Total Energy Consumption Ratio, %**

**15**

**20**

**Share of Renewable Energy in Total Energy Consumption, %**

**6**

**9**

**Market Share of Russia in Total Energy Import, %**

**90**

**70**

**Energy Import to GDP Ratio, %**

**20**

**15**

**Share of Dominant Energy Resource (Natural Gas) in Total Energy Consumption, %**

**60**

**50**

**First Nuclear Power Plant (2400 MW) under Construction (Operation Will Start in 2019 – First reactor 1200 MW and...2021? Second reactor 1200)**

# Electric power balance

The balance of electric energy in 2005-2015,  
billion kWh

	2005	2010	2012	2013	2014	2015
Production	<b>30 961</b>	<b>34 890</b>	<b>30 794</b>	<b>31 495</b>	<b>34 737</b>	<b>34 082</b>
Combined Heat and Power	30 924	34 844	30 716	31 349	34 605	33 942
Hydroelectric power plants	36	45	72	138	121	107
Wind turbines	1	1	6	8	9	26
Solar installations	0	0	0	0,4	2	7
Import	4 936	2 971	7 899	6 716	3 826	2 816
Export	900	271	298	346	508	194
Consumption	<b>34 997</b>	<b>37 590</b>	<b>38 395</b>	<b>37 865</b>	<b>38 055</b>	<b>36 704</b>

- ❑ In Belarus, the main volume of electricity production is provided by combined heat and power plants
- ❑ The country annually reduces the volume of imported electricity



## ENERGY SECURITY CONCEPT 2035

Increase of energy independence should be carried out taking into account the maximum possible involvement in the fuel and energy balance local energy resources, primarily renewable energy sources

## The projected figures of the main indicators of the balance of electric energy for the period up to 2035 (Belarusian Energy Security Concepts)

	2010	2015	2020	2025	2030	2035
Electricity production (billion kWh)						
Total	34,89	34,48	39,9	41,6	42,1	43,8
including:						
Combined Heat and Power	34,84	34,21	31,85	21,8	22	23,2
Renewable energy	0,05	0,27	0,95	1,8	2,1	2,6
Nuclear power plant	–	–	7,1	18	18	18
Net electricity imports	2,7	2,82	–	–	–	–
Electrical energy consumption	37,59	37,3	39,9	41,6	42,1	43,8



# Challenges

- Electricity consumption in Belarus does not grow, but decreases.
- The launch of two NPP reactors by 2020 will add to this another 18 billion kWh - that is, plus almost 50% of what Belarus consumes.
- Russia and Ukraine have enough of their own electricity, they even have their own nuclear power plants at our borders - Smolensk and Rovno. Lithuania refused to buy electricity from Ostrovets NPP
- Strong dependence on Russian resources

# Presidential Decree No. 209 "On the use of renewable energy sources" May 2015

Quotas were introduced for the construction RE power plants

Special commission determines the total capacity of the facilities, and within its framework state will purchase electricity at high tariffs through electric grids. This commission also establishes and distributes quotas for the construction of installations by type (energy of the sun, wind, water, biogas).

In May 2017, the commission set quotas until 2020. The quota for solar power plants will be only 5.025 MW, biogas - 2.72 MW, wind power - 2.5 MW.



## Wind Energy Potential in Belarus

The potential of wind energy in [Belarus](#) is estimated to equal 1.9 – 2.0 Mtoe per year. The potential of wind farm energy is estimated at 220 billion kWh. A survey has been done by the government resulted in 1,840 sites fit for placing of wind turbines with the potential energy output of over 1,600 MW.





## Solar energy Potential in Belarus

The potential of solar energy technically convertible into electricity, which was calculated on the basis of unused land in the Republic of Belarus and efficiency of the modern panels (0.16), is 609.8 TWh that being 10 times more than the amount of the country's electricity consumption.

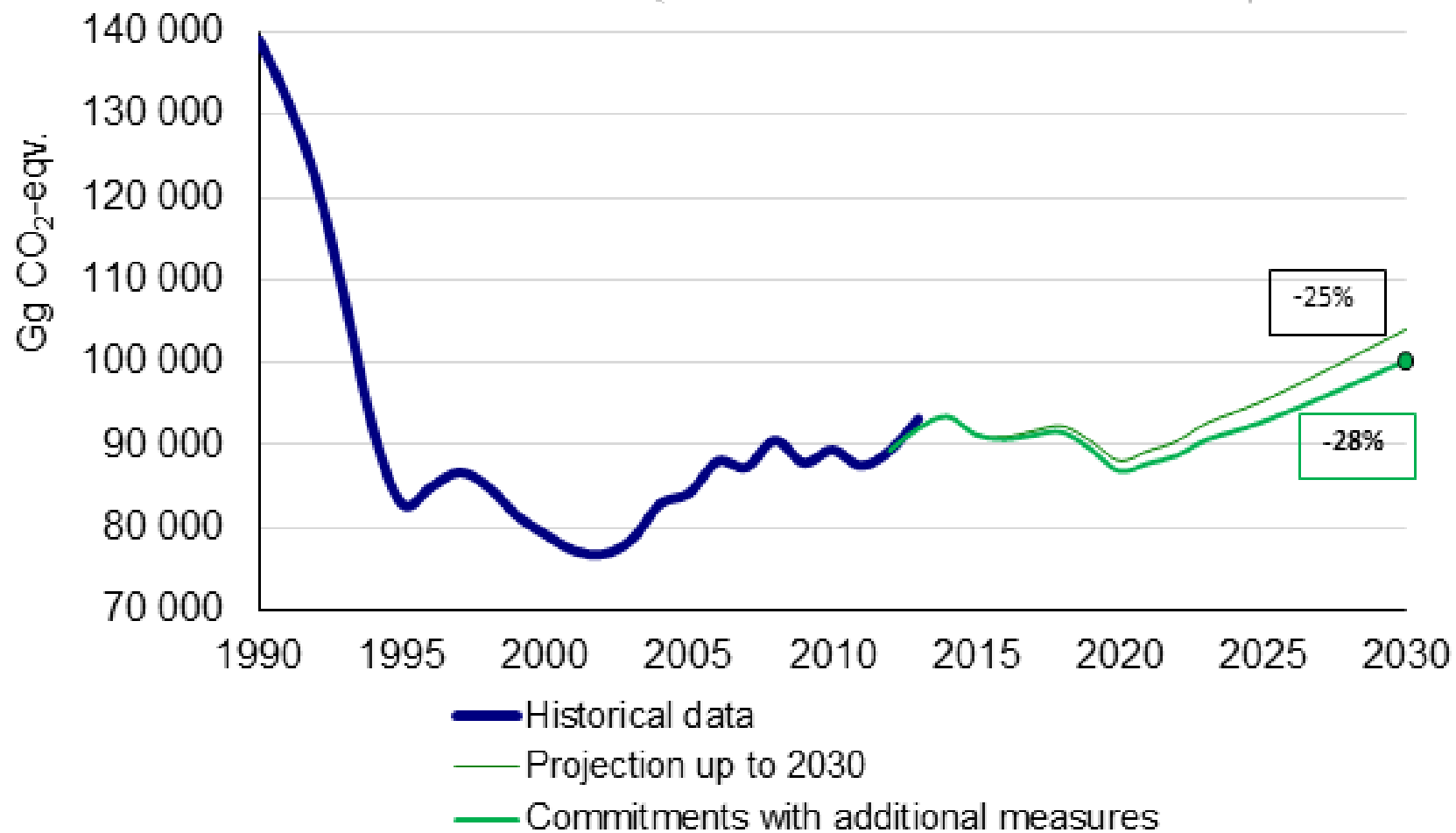
A faint, light green outline map of Belarus is visible in the background of the slide. At the top, there is a solid green horizontal bar.

## Biomass Potential

The energy potential of agricultural waste in the Republic of Belarus is estimated at 1.7 - 2.5 million toe / year.

The potential average annual harvesting of wood fuel resources in the Republic of Belarus amount to 13.6 million m<sup>3</sup> in 2015, that is equivalent to 3.7 million toe.

## Belarus National CO2 Emissions Reduction Targets (INDC)



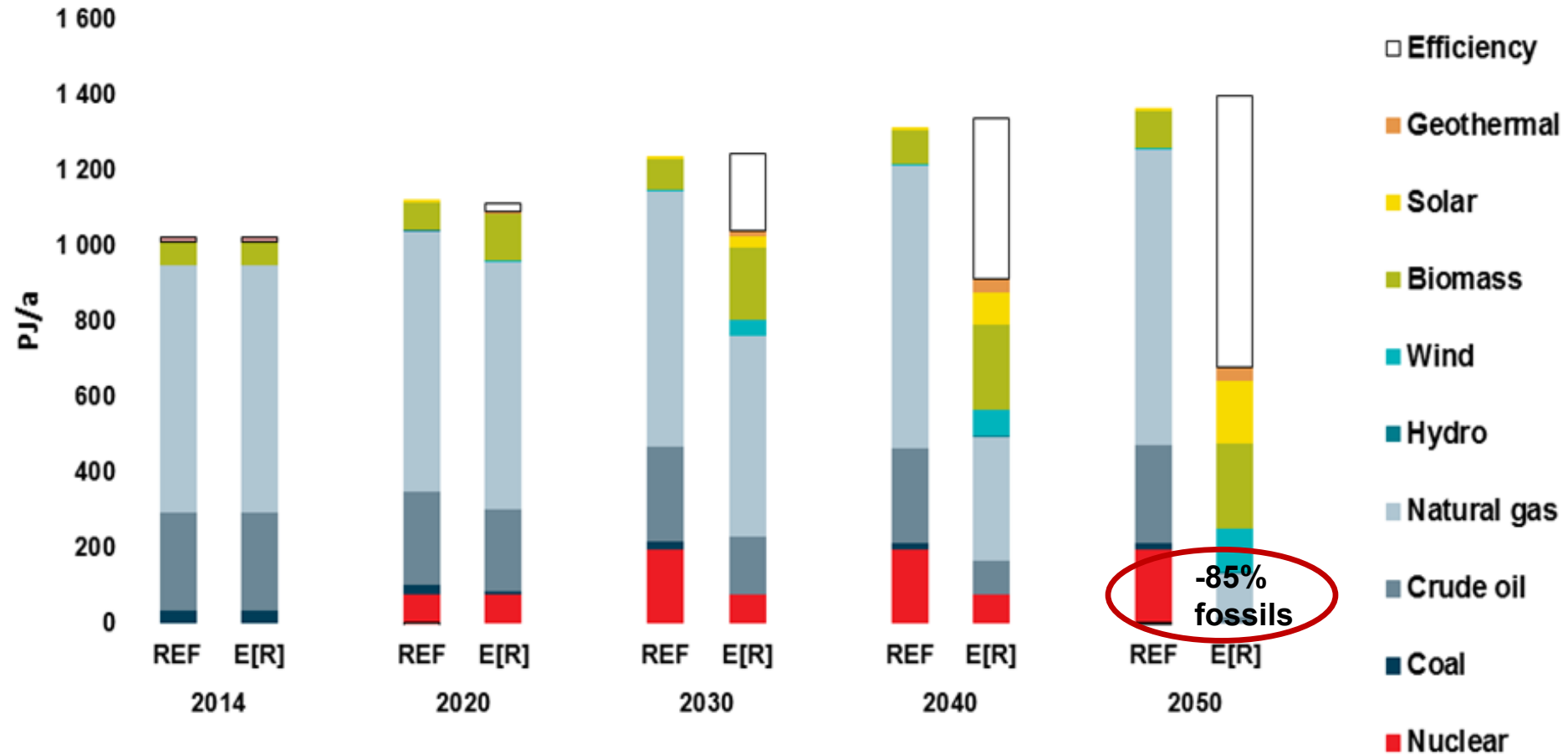
# Energy [R]evolution – a sustainable energy outlook for Belarus

Department Energy Systems Analysis  
Institute of Engineering Thermodynamics  
German Aerospace Center (DLR)

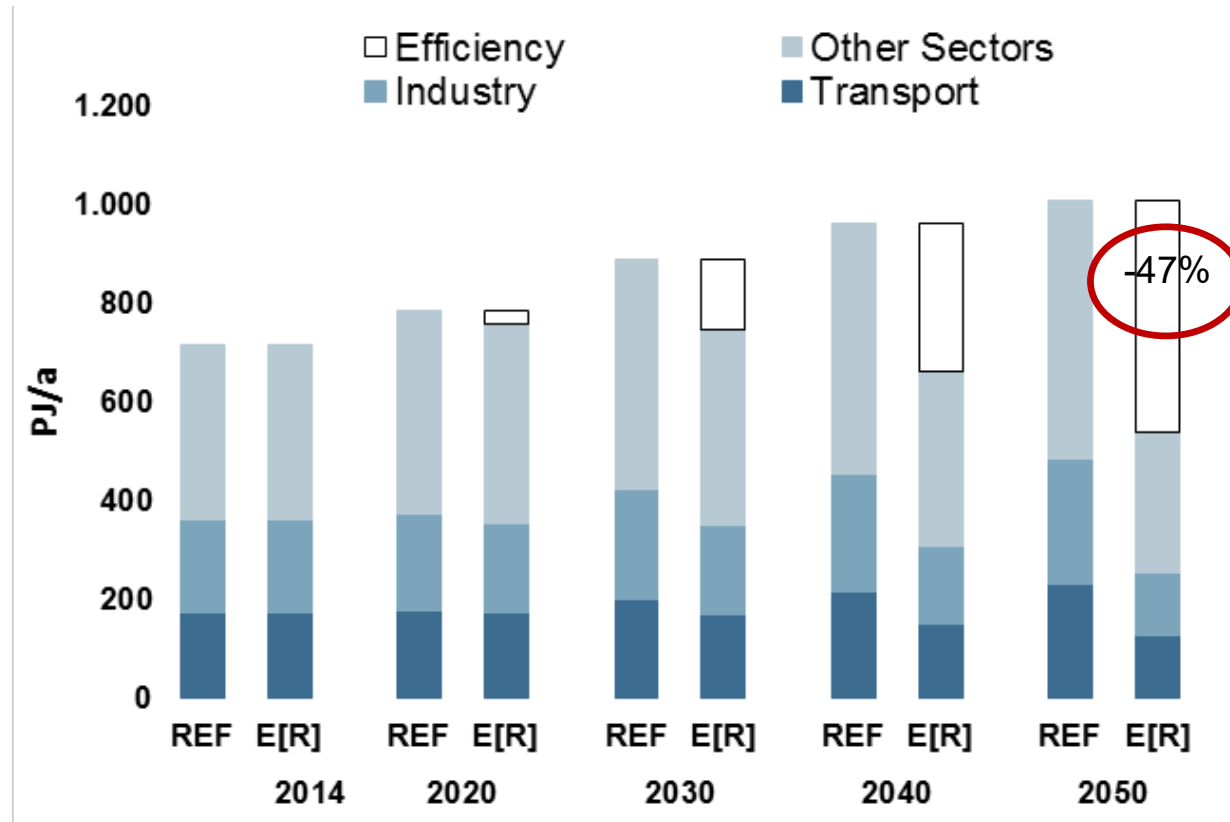
Knowledge for Tomorrow



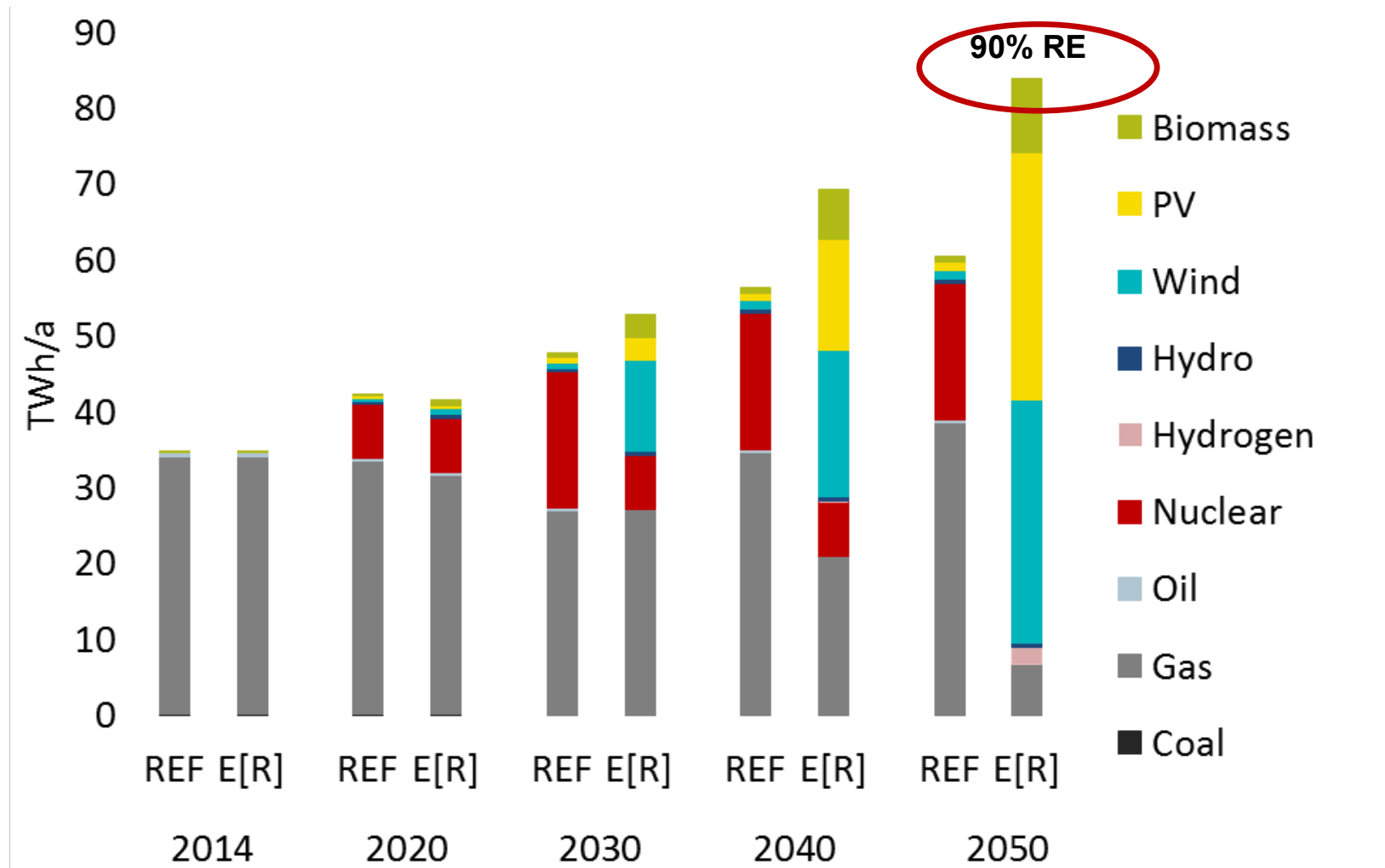
# Primary energy demand – scenarios REF, E[R]



# Development of total final energy demand by sector – scenarios REF, E[R]



# Electricity generation under the REF and E[R] scenarios



# CO2 Emissions under the REF and E[R] scenario

